REMARKS/ARGUMENTS

Applicants respectfully request reconsideration of the above-identified application.

With the present amendment and response, Applicants have amended claims 3, 5, 7, 11, and 16 to replace the article "a" with --an-- to overcome the Examiner's objection to those claims.

In support of their arguments made below, Applicants submit herewith a Declaration under 37 C.F.R. 1.132 of Victor V. Kulish ("Kulish Declaration"). Dr. Kulish holds bachelor and master of science degrees in Radio-engineering from the Special Faculty of Moscow Energetical Institute, a doctoral degree in Theoretical ad Mathematical Physics from the Kiev State University and a doctor of science degree in Physical Electronics from the Institute of Physics of Ukranian Academy of Sciences, all in Kiev, Ukrane. Kulish Declaration, ¶ 2. As indicated in his curriculum vitae, attached as an exhibit to his declaration, Dr. Kulish has published over 200 scientific works, including three monographs and two-volume textbooks. He currently holds the positions of Director of the Institute of Advanced Technologies and the Head of Department of Theoretical Physics at National Aviation University (Kyiv, Ukraine), Doctor of Sciences, and Professor of Physics.

Claims 1-5 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the admitted state of the art in view of U.S. Patent No. 6,628,750 filed November 9, 2000 and issued September 30, 2003 to Korenev (hereinafter, "Korenev").

None of the cited references disclose or suggest the use of a multi-channel linear accelerator in a sterilizer application. That is not disputed. It is the Examiner's position, however, that a multi-channel induction accelerator is simply a linear induction accelerator with multiple radiation energy level outputs. As such, the Examiner contends that claim 1 would be obvious in view of the admitted state of the art regarding linear induction accelerators in combination with Korenev, which discloses using either an RF-type accelerator with multiple radiation energy level outputs or providing multiple radiation energy level outputs by using a plurality of linear accelerators, each with a different radiation level output.

A multi-channel linear induction accelerator (MLIA) is not simply a linear accelerator with multiple radiation energy level outputs. As noted in Applicants previous response and in Dr. Kulish's declaration attached hereto, an MLIA eliminates problems experienced by linear induction and RF-type accelerators while at the same time providing significant benefits that RF-type accelerator and plurality of linear accelerators do not. Specifically, in an MLIA the acceleration channels of any two neighboring linear acceleration blocks are directed reciprocally opposite to one another. Owing to this, the external electric fields generated by each

acceleration block effectively cancel each other out and, thus, produce a much smaller external electric field, which is safer for workers, eliminates the "dead zone" associated with LIAs, and allows the MLIA to be used in a broader range of applications. An MLIA provides increased acceleration rates of the separate linear accelerators and can operate in a trigger mode wherein one part of the acceleration block accelerates the beams, while the other part "rests" enabling the magnetic cores therein to remagnetize. RF-type rotary accelerators utilize microwave generators to accelerate the electrons. Such generators are relatively expensive to produce and operate, and, as with linear induction accelerators, have a negative impact on the work environment and certain food and pharmaceutical products. Kulish Declaration, ¶¶ 7-16.

It should be further noted that there is no teaching or suggestion in the references as to how a single linear induction accelerator could be modified to have a plurality of energy level outputs. Kulish, ¶ 16. Korenev, in fact, teaches that if LIAs are used, a separate accelerator must be used for each desired energy level output. Kulish Declaration, ¶ 17. Such a configuration would clearly compound the problems associated with LIAs. Id. at ¶ 18.

In view of the above, claim 1 is not obvious in view of linear accelerators, RF-type rotary accelerators or the combination thereof. Claims 2 and 3, dependent on claim 1, should be considered patentable for the same reasons.

Claim 4 further recites providing "said multi-channel linear inductor accelerator system as having more than one channel, each providing a channel-designated discrete said output" and "said step (c) manipulates each said channel-designated output by magnetically causing it to sweep across that said treatment region associated with said channel-designated output." In this embodiment, multiple outputs are all swept across the treatment area so that the material is acted on by all of the outputs in a single pass. See Fig 3. Using multiple outputs on a single treatment region provides for a more efficient system as different portions of the treatment region may be acted on simultaneously. Additionally, the power of any single output of the MLIA may be less than that which would be required if a single output beam were used to irradiate a given product as in Korenev. Kulish Declaration, ¶ 22.

This should be contrasted with Korenev, where only a single output acts on a given treatment region. Specifically, each output is directed to a designated conveyor carrying a particular product to be irradiated. In use, the radiation type for each output port is determined (e.g., x-ray or electron beam), then the electron energy for that output is chosen, as is the speed for the conveyor associated with that output port. If additional radiation is needed for a given product, the product must make a second pass on the same conveyor or must be moved to a different conveyor for irradiation with a different intensity of radiation. Korenev does not sweep

all of the outputs across a single treatment region during one pass through the device as does the claimed invention. See Kulish Declaration, ¶ 20.

Claim 5, dependent from claim 4, should be considered patentable for the reasons given in connection with claims 1 and 4.

Claims 6, 7, 10-12, and 15-17 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the admitted prior art in view of Korenev and in further view of U.S. Patent No. 5,357,291 issued October 18, 1004 to Schonberg, et al. (hereinafter, "Schonberg").

Claim 6 further recites "said step (c) manipulates each said channel-designated output by defocusing it to derive an expanded channel-designated output at said treatment region in a manner wherein said channel-designated outputs of adjacent said channels are caused to overlap and mutually extend over said treatment region." With this configuration, the output of multiple channels overlap and cover the entire surface of the product as shown in Fig. 4 of the present application.

Schonberg describes a transportable electron beam system utilizing a pulsed linear electron accelerator, the electrons being accelerated by energy generated by a microwave source such as a magnetron. The output of the accelerator is a single electron beam as shown in Figs. 3 and 4, which may be defocused onto a window which separates the accelerator from a reaction chamber. Kulish Declaration, ¶ 23. Applicants do not dispute that Schonberg discloses the defocusing of a single electron beam. However, it does not make up for the deficiencies of Korienev, and the combination of Korenev and Schonberg does not teach or suggest the claimed invention, which calls for providing multiple outputs that overlap and cover the entire treatment region. As noted above, Korenev is designed to provide a single output for a single treatment region. The plurality of products, or treatment regions, of Korenev are on spaced apart conveyors and the accelerator outputs clearly do not overlap. If the defocusing element of Schonberg were added to each ouput of Korenev, the result would simply be the defocusing of each output onto its designated product.

Claim 7, depends from claim 6, and should be considered patentable for the reasons given in connection with claims 1 and 6.

Claims 10-12 and 15-17 all depend from claim 1 and should be considered patentable for the reasons given above in connection with claim 1.

Claims 8-9, 13-14 and 18-19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the admitted prior art in view of Korenev and Schonberg and in further view of U.S. Patent No. 4,704,565 issued November 3, 1987 to Blacker, Jr. et al. (hereinafter, "Blacker").

The Examiner argues that it would have been obvious to modify Korenev and Schnonberg by including means for forming beam spots of different shapes as disclosed by Blacker since forming a small symmetrical beam spot is a major factor in achieving optimum resolution. Regardless of the shape of the beam, azimuthally-symmetrical or azimuthally-asymmetrical, the present invention defocuses the output beams to cause the outputs to overlap and cover the treatment region. Blacker addresses the exact opposite situation where the output is desired to be focused on as small a region as possible. As such Backer is completely inapplicable to the problem at hand. Kulish Declaration, ¶¶ 26-28.

In view of the foregoing remarks, wherein the claim program is seen to readily distinguish over the references, Applicants earnestly solicit issuance of a Notice of Allowance.

Respectfully submitted,

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Diane E. Burke
Reg. No. 45,725
MUELLER AND SMITH, L.P.A.
Mueller-Smith Building
7700 Rivers Edge Drive
Columbus, Ohio 43235-1355
Tel.: 614-436-0600
Fax: 614-436-0057
email: *dburke@muellersmith.com*

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Jane Keeney